# Volatility Shifts and Persistence in Variance: Evidence from the Sector Indices of Istanbul Stock Exchange

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**Abstract**

*This study examines the impact of volatility shifts on volatility persistence for three major sector indices of Istanbul Stock Exchange (ISE) and ISE National 100 index over the period beginning from 1997 and ending in 2009. The exponential generalized autoregressive conditional heteroskedasticity (EGARCH) model is extended by taking account of the volatility shifts which are determined by using iterated cumulative sums of squares (ICSS) and modified ICSS algorithms such as Kappa-1 (κ-1) and Kappa-2 (κ-2). The results indicate that the inclusion of volatility shifts in the model substantially reduces volatility persistence and suggest that the sudden shifts in volatility should not be ignored in modelling volatility for Turkish sector indices.*

**Keywords:** Stock return volatility, volatility shifts, persistence, Turkish stock market

**JEL classification:** C22, C52, C58

## 1. Introduction

It is important for investors, fund managers and policy makers to determine the volatility of stock markets for pricing the financial assets, managing risks and predicting future volatility. In estimating volatility, autoregressive conditional heteroskedasticity (ARCH) family models have gained attention and are used by many finance researchers as they are simple to implement and able to cover the stock return volatility features such as clustering and mean-reverting. However, the shortcoming of these models might be the overestimation of the persistence of volatility, which might cause misinterpretation on volatility persistence and spurious volatility modelling (see for example Lastrapes, 1989; Lamoureux and Lastrapes, 1990; Malik, 2003; Ewing and Malik, 2005). The standard ARCH models assume that there is no shift in volatility, yet especially in emerging markets there

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